

Notice of Allowability	Application No.	Applicant(s)	
	09/591,270	SHEPARD, KENNETH	
	Examiner	Art Unit	
	Ayal I. Sharon	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment & 1.132 Declaration filed 2/28/06.
2. ☒ The allowed claim(s) is/are 9-11.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 2/6/06.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
|---|--|

DETAILED ACTION

Introduction

1. Claims 9-11 of U.S. Application 09/591,270 are currently pending. Claims 1-8 and 12-22 have been cancelled.
2. The application, originally filed on 06/09/2000, claims priority to provisional application 60/138,842 filed on 06/10/1999.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
4. Authorization for this examiner's amendment was given in a telephone interview with Mr. Paul Ragusa, Reg. No. 38,587 on 6/02/06.
5. Page 1 of the specification in the application has been amended as follows:

From:

---- SPECIFICATION ----

To:

---- SPECIFICATION

Art Unit: 2123

This application claims priority to U.S. Provisional Application No. 60/138,843, filed on June 10, 1999. ----

Affidavit / Declaration

6. The declaration under 37 CFR 1.132 filed 2/28/05 is sufficient to overcome the questions of inventorship raised in the 37 C.F.R. §1.105 Requirement for Information dated 2/24/04, and based upon the references cited in the Requirement for Info document.
7. Examiner finds that the declaration clarifies Mr. Chuang's role in the claimed invention, and conforms to the requirements of a "Katz declaration" in accordance with MPEP § 2132.01 and *In re Katz*, 687 F.2d 450, 215 USPQ 14 (CCPA 1982).
8. Examiner notes that the declaration filed 2/3/05, paragraphs 10-13, clarified Mr. Kim's role in the claimed invention.

Examiner's Statement of Reasons for Allowance

9. Claims 9-11 are allowed.
10. The following is an examiner's statement of reasons for allowance.
11. The prior art used for these rejections is as follows:
 - a. Chuang et al., U.S. Patent Application Publication No. US 2003 / 0078763 A1. Filed: April 19, 1999. ("**Chuang**").

- b. Shepard, K.L. et al. "Body-Voltage Estimation in Digital PD-SOI Circuits and Its Application to Static Timing Analysis". 1999 IEEE/ACM Int'l Conf. on CAD. Nov. 7-11, 1999. pp.531-538. ("**Shepard**").

12. In regards to Claim 9, Chuang teaches the following limitations:

Claim 9 (currently amended): A method for statically estimating a body voltage of one or more transistors which form digital partially depleted silicon-on-insulator circuit having, a predetermined circuit topology comprising said one or more transistors and one or more nets connecting said transistors, comprising the steps of:

a. obtaining one or more device models selected from the group consisting of an n channel Field Effect Transistor model and a p channel Field Effect Transistor model each corresponding to one of said one or more transistors;

(Chuang, especially: Figs.1 and 5, and associated text)

c. checking said predetermined circuit topology to generate one or more sets of accessible states, each set corresponding to one of said one or more transistors and being indicative of whether under any allowable switching activity, the source, gate or drain could be high or low;

(Chuang, especially: Fig.2 and associated text)

e. determining one or more sets of reference state body voltage minima and reference state body voltage maxima, one for each of said one or more transistors based on corresponding simplified electrical descriptions and corresponding sets of accessible states; and

(Chuang, especially: Fig.6 and associated text)

f. ascertaining one or more target state body voltage minima and target state body voltage maxima, one for each of said one or more transistors, based on said determined sets of reference state body voltage minima and reference state body voltage maxima.

(Chuang, especially: Fig.6 and associated text)

Chuang also teaches that "The body voltage is modulating during the switching event due to the gate-to-body and diffusion-to-body coupling; and thus only a transient analysis can properly model these coupling effects" (see Chuang: Abstract).

However, Chuang does not expressly teach displacement voltages, steady-state reference voltages, or forward bias voltages as in the limitations, as recited in the following claim limitation:

b. abstracting each of said n channel Field Effect Transistor models if any, and each of said p channel Field Effect Transistor models, if any, to obtain one or more displacement voltages d_i , steady-state reference voltages V_i^{Zero} , and forward bias reference voltages V_i^{forward} , for each of said device models to generate one or more simplified electrical descriptions, each corresponding to one of said one or more transistors:

Shepard, on the other hand, expressly teaches that "In characterizing the body voltage, we choose a reference state of state 2 for the nFET and state 1 for the pFET. The discontinuities between the (time) slices occur as a result of the capacitive coupling kicks and are characterized by the voltage differences, or displacements d_i ." (see Shepard: p.532, col.2, section 3.1, 1st para.).

More specifically, Shepard teaches displacement voltages (see Shepard, section 3.1, 1st para.), steady-state reference voltages (see Shepard, p.532, section 3.1, Eq.3; and p.533, col.1, para. 2), and forward bias voltages (see Shepard, p.533, col.1, para. 2-3), as recited in the claim limitations.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Chuang with those of Shepard because while both Chuang and Shepard teach that the body voltage modulations are due to coupling effects. Shepard's model "allows one to determine the body voltage and its associated uncertainty, depending on knowledge of the switching activity of the FETs in question." (Shepard, p.538, col.1, para.2).

On the other hand, neither Shepard nor Chuang, taken either alone or in combination with the prior art of record, expressly teach the elements for:

d. performing active net tagging on each of said one or more nets to determine whether any of said one or more nets will switch with regular frequency

in combination with the remaining elements and features of the claimed invention.

13. It is for these reasons that the Applicants' invention defines over the prior art of record.

14. Claims 10-11 depend from allowable claim 9, and therefore are also allowable.

15. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (571) 272-3714. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached at (571) 272-3753.

Any response to this office action should be faxed to (571) 273-8300, or mailed to:

Art Unit: 2123


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or hand carried to:

USPTO
Customer Service Window
Randolph Building
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Alexandria, VA 22314

Any inquiry of a general nature or relating to the status of this application
or proceeding should be directed to the Tech Center 2100 Receptionist, whose
telephone number is (571) 272-2100.

Ayal I. Sharon
Art Unit 2123
June 2, 2006


Paul L. Rodriguez 6/9/06
Primary Examiner
Art Unit 2125
swm